CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: May 21, 2003 FILE REF: 4561

TO: Natural Resources Board

FROM: Scott Hassett – AD/5

SUBJECT: Recommendation for Adoption of Mercury Emission Reduction Rules

Introduction

These rules are designed to reduce the atmospheric deposition of mercury by restricting emissions from major electric utilities. Mercury moves through the environment and can contaminate the food chain, posing a serious threat to ecosystem health. Mercury from natural and human sources is released to the atmosphere, where it is transported and may be deposited in terrestrial and aquatic ecosystems. Bacterial action in lakes and waterways converts mercury to a more toxic form, methylmercury, which bioaccumulates in fish. Bioaccumulation is the build-up of a substance in an organism from the surrounding air or water, or through the consumption of contaminated food.

Elevated methylmercury levels may lead to a decline in wildlife populations and may affect human health from the consumption of sufficient quantities of contaminated fish. Coal-fired boilers in the state do not have limitations on their mercury emissions at this time even though they are our largest source of mercury emissions. This initiative is being taken to reduce mercury emissions from the existing coal-fired boilers operated by the four major electric utilities in Wisconsin.

The proposed rules that went to public hearing in September and October 2001 elicited strong and differing views on several important provisions. The most significant concerned the appropriate schedule and amount of mercury emission reductions that should be required from facilities operated by the four major electric utilities in the state. It is important to acknowledge that Wisconsin's major electric utilities have consented to regulations that would require a 40% reduction in their mercury emissions.

Electric utility representatives stated that the mercury emission reduction requirements proposed would not maintain and protect the reliability of electricity. In their assessment, they felt the only way to achieve 90% reduction in mercury emissions was to rely on natural gas to generate electricity and phase-out all coal-fired units. They expressed concern that limiting fuel diversity through a heavy reliance on natural gas would lead to an increase in electric reliability uncertainty and electrical costs for consumers that would be too high. Other stakeholders felt that significant mercury emission reductions needed to occur much sooner than the schedule provided in the proposed rules and that the emission trading provisions greatly diminished the responsibility of major utilities to achieve reductions in mercury emissions.

The Department has carefully constructed a mercury emission reduction approach in the attached rules that addresses many of the views provided in public comment. The revised rules are based on these comments and a reevaluation of control technology and costs. The rules also include an option for a multi-pollutant reduction alternative, an approach preferred by some of the major utilities as it allows long range planning to meet air pollution control requirements for other air contaminants, including mercury.

In addition, trading provisions have been revised significantly based on findings that a viable open market system cannot be sustained.

The Department believes it is in the state's interest to establish regulations that define the amount of mercury emission reductions that are technically achievable on a schedule appropriate for the state's major utilities. At this time there are no federal requirements to reduce mercury emissions on existing coal-fired boilers operated by major electric utilities. There is, however, a pending federal MACT (Maximum Achievable Control Technology) regulation under Section 112, Hazardous Air Pollutants, of the Clean Air Act, with a court-ordered deadline of December 15, 2004, to promulgate that MACT standard. Also, in the U.S. Congress, several bills have been introduced in the current session, including the President's "Clear Skies" proposal, that require electric utilities to pursue a multi-pollutant reduction approach for the principal air pollutants that are emitted by fossil fuel combustion.

These legislative proposals include mercury as one of the principal pollutants. In any event, if a MACT standard is eventually adopted that regulates mercury or if the "Clear Skies" bill is enacted with mercury requirements, the proposed rules contain provisions that will allow the federal and state requirements to be reconciled. The Department is concerned that these pending federal actions will fail to provide for adequate and timely mercury emission reductions.

Acting alone, Wisconsin cannot eliminate mercury-related fish consumption advisories in our waterways. Wisconsin's environment seems to be responding favorably to mercury emission reductions that have been achieved through actions already taken in other sectors.

The revised rules establish an appropriate response to the serious mercury contamination in our environment and the related public health consequences that will continue if further mercury emission reductions do not occur. The revised rules provide credibility to Wisconsin's position that the federal government through legislation, or regulation or both avenues must require significant reduction in mercury emissions.

Why is the rule being proposed?

What event or action triggered the proposal?

In December 2000, the Board adopted a resolution that granted a citizen petition seeking rules to reduce mercury emissions to the air. The Board directed staff to develop proposed rules that protect public health and the environment, and are also cost-effective, reasonable, and do not interfere with the ability of electric utilities to supply the state's energy needs. Under the authority of s. 285.11(9), Wis. Stats., proposed administrative rules have been developed to reduce mercury emissions.

What are the issues addressed by the rule?

The Department asserts that emissions of mercury from coal-fired boilers used to generate electricity and from other major mercury sources significantly contribute to mercury entering water bodies and ultimately fish and wildlife. Furthermore, atmospheric mercury deposition has contaminated nearly all of the state's water bodies to some level resulting in a statewide fish consumption advisory that was adopted at the February 2001 Natural Resources Board meeting. The resolution adopted by the Board in December 2000 requires the proposed administrative rules to include the following:

1. The percentage reductions in mercury emissions and a phased schedule for achieving the reductions.
2. A methodology for determining baseline emissions levels.
3. An emissions trading and banking system.
4. A provision to allow for alternative compliance options, such as relying on projects that achieve voluntary mercury emission reductions from sources not covered by the rules.
5. A provision that would allow the Department to grant variances, such as deadline extensions and alternative emission limits, if it determines that compliance with reduction requirements is not technologically feasible, would jeopardize electric reliability or would cause unreasonable hardship as long as the variance would not result in undue harm to human health or the environment.
6. A provision that the Department submit a report to the Board by the end of 2007 that:
   a. Evaluates the mercury reduction requirement in light of electric reliability, scientific and technological developments, and federal regulatory activity, and recommends adjustments to the reduction requirements, if appropriate.
   b. Assesses the impacts of emissions trading on localized water quality and recommends corrective actions if needed.

Summary of Changes to the Rules

Department staff revised the rules based on public comments received as part of the public comment and public hearing process. Although changes have been made, the focus of the revised rules has not changed. The revised rules are designed to achieve mercury emission reductions from facilities operated by the states' four major utilities in a manner that meets the principles established in the Board's December 2000 resolution.

Below is an overview of the changes that have been made. For a more detailed discussion on these changes see *Attachment A – Summary of Comments on the Proposed Rules*.

Major Utility Mercury Reductions

The proposed rules have been changed to require major electric utilities in the state to reduce their baseline mercury emissions in two-steps. An initial reduction of 40% is required beginning January 1, 2010. A final reduction of 80% from baseline emissions begins January 1, 2015. An analysis that supports the mercury emission reduction schedule and reduction levels in the revised rules can be found in *Attachment B – An Assessment of Major Utility Mercury Air Emission Control and Costs*.

Multi-pollutant Alternative

A multi-pollutant reduction option is also included in the proposal. Under this option, owners and operators of major utilities may obtain relief from the initial reduction requirement of 40% upon Department approval of a multi-pollutant reduction proposal.

Baseline Emission Determination

The baseline determination approach has changed substantially. In the rules proposed for hearing, the foundation for setting the baseline was a measurement of emissions leaving the stack after existing air pollution control equipment had achieved some reductions in mercury emissions. In place of this approach, the rules have been revised to establish a baseline that reflects the mercury emissions released

when coal is burned without considering mercury reductions achieved by any existing air pollution control equipment.

This change addresses a significant objection made by the major utilities that the proposed rules did not recognize or account for the actions they have already taken to reduce their mercury emissions. Based on the air pollution control equipment the major utilities are operating today, 15% to 20% of the mercury from coal combustion is being captured. Thus to meet the initial mercury reduction of 40%, the four major utilities, on average, need to achieve an additional 20 to 25% mercury reduction by January 1, 2010. To meet the final reduction requirement of 80% by January 1, 2015, baseline emissions need to be reduced an additional 60 to 65%.

Compliance Alternatives for Major Utilities

Compliance with requirements in the proposed rule can be achieved through the application of the surrogate control technology outlined in *Attachment B – An Assessment of Major Utility Mercury Air Emission Control and Costs*. Under the changes that have been made, major utilities will still be allowed to average their mercury emissions across their entire system to demonstrate compliance. Also, major utilities could enter into agreements with each other to use excess reductions to meet the proposed mercury reduction requirements. Therefore, the proposed rules will still have trading provisions to provide compliance flexibility and to help lower compliance costs.

Certified Emission Reductions

The trading provisions in the proposed rules have been substantially changed based on further analysis of the viability of these provisions. The opportunity to create certified emission reduction credits through a *pollution reduction project* or *mercury-containing products reduction projects* have been removed. See *Attachment A – Summary of Comments on the Proposed Rules* for more details on this analysis. In the initial proposal, certified emission reductions could be used by a major utility to meet a portion of their mercury reduction requirements or these credits could be used to provide emission offsets in the permitting of a new source.

Electric Reliability Waiver

The variance provisions in the proposed rules have been revised to distinguish between an inability to meet reduction requirements based on short-term electric reliability problems from those significant barriers that would prevent a major utility from implementing a plan to meet the phased reduction requirements in the rules. To address short-term reliability concerns a specific section has been added that provides opportunity for a major utility to request a waiver from meeting a annual mercury reduction requirement due to an operational event beyond the control of a major utility. This waiver is proposed to address the concern that the proposed variance provisions were not a good mechanism for addressing short-term electric reliability problems. The Public Service Commission would be consulted on each waiver request.

Industry Role

In the rules taken to public hearing, major stationary sources (those with annual mercury emissions greater than 10 pounds) were required to establish an emission baseline, have an annual emissions cap, and could opt to voluntarily reduce mercury emissions to create reduction credits to use or trade to others

to meet requirements. These provisions have been eliminated in the revised rules. However, the rules still set uniform procedures for determining annual emissions from major stationary sources. A positive development from the dialogue on the industry role in mercury emission reduction was an interest in an energy efficiency improvement program for industrial and commercial combustion sources instead of an emission cap. Preliminary discussions have occurred with industry representatives on the elements of a voluntary program to reduce mercury emissions that would include an energy efficiency component.

Managing Growth in Mercury Emissions

The requirement in the rules that went to public hearing that new and modified sources obtain mercury emission offsets has been replaced by a requirement for new or modified sources to have their mercury emissions controlled by best available control technology. Projects that could emit 10 or more pounds of mercury would be affected. New projects subject to a federal mercury requirement under Section 112 of the Clean Air Act, it would be exempt from this requirement.

Periodic Rule Evaluations

A provision has been added that will require staff to provide the Board a reconciliation report within six months of the promulgation of a federal MACT regulation or upon enactment of a federal law that would require mercury reductions from electric utility boilers in the state. The requirement for a reconciliation report is in addition to periodic reports to the Board that would comprehensively evaluate new developments in science and technology related to mercury reduction and control. The frequency of periodic evaluations to the Board has been reduced in the revised rules. A report is now required by January 1, 2009, and an updated report is due by January 1, 2013. An evaluation report is scheduled to occur in advance of each mercury reduction requirement to provide an update on mercury science and technology as well as to recommend any needed revisions to the rules.

Chronology of Key Events in the Proposed Rule

Date	**Event**
October 1, 2005	*Major utilities submit a report of their baseline emissions using procedures specified in the rule. Stack emission test data for all coal-fired boilers is also due.*
January 1, 2007	*Department notification that establishes baseline mercury emissions and the mercury emissions cap for each major utility.*
October 1, 2007	*Compliance plan due for the initial reduction requirement of 40% and deadline for application for a multi-pollutant alternative or variance from the January 1, 2010, reduction requirement.*
January 1, 2008	*Mercury emissions cap becomes effective.*
January 1, 2009	*1st evaluation report provided to the Board.*
January 1, 2010	*40% mercury emission reduction requirement becomes effective.*
October 1, 2011	*Compliance plan due for final reduction requirement. Deadline for application for a variance from the January 1, 2015, reduction requirement.*
January 1, 2013	*2nd evaluation report provided to the Board.*
January 1, 2015	*80% mercury emission reduction requirement becomes effective.*

Summary of Control Technology and Costs

Attachment B – An Assessment of Major Utility Mercury Air Emission Control and Costs provides the detailed analysis of direct economic impact and cost to affected groups for the major electric utilities to install and operate a surrogate control technology to meet the proposed mercury reduction requirements in the revised rules. The surrogate technology selected is a combination of activated carbon injection and a fabric filter system. Next, the estimated cost of installing activated carbon injection and a fabric filter system was used to determine the potential increase in electricity rates for customers. A combination of activated carbon and a fabric filter system, as the surrogate control technology, is not the only available option for major electric utilities to meet mercury reduction requirements. However, based on USEPA (United States Environmental Protection Agency), NETL (National Energy Technology Lab), and EPRI (Electric Power Research Institute) reports, carbon injection with a fabric filter system represents the most practical and available technology for achieving significant mercury reductions.

The cost of applying the surrogate technology included the cost of equipment purchase and installation, purchase of activated carbon, annual operation and maintenance, and fly ash disposal and lost revenue for ash that cannot be reused. For larger generation units (greater than 200 mega-watts) the control approach is activated carbon injection and a fabric filter system installed downstream of the existing pollution control equipment. This provides higher mercury reductions and greatly reduces the potential contamination of fly ash generated by these units. In general, fly ash has high reuse value (e.g. cement additive). For small generating units (less than 200 mega-watts), activated carbon injection only in front of the existing particulate control equipment was applied. This method is significantly less expensive.

The first phase of control, a 40% mercury emission reduction, has an annual combined cost for the four major utilities estimated to be in the range of $28 - 33 million. The added consumer cost is estimated to be between 0.06 - 0.07 cents per kilowatt-hour. For an average household consuming 770 kilowatt-hour per month, this results in an additional cost of $6 - 7 per year. The second phase of control, a mercury emission reduction of 80%, results in an annual cost to the major electric utilities in the range of $87 - 104 million. The added consumer cost of 0.19 - 0.23 cents per kilowatt-hour or for the average household, $18 - 21 per year.

How would enactment of these rules affect existing policy?

Existing air management regulations set emission standards for mercury to protect the public from unacceptable mercury exposure due to the direct inhalation of mercury. They do not address the bioaccumulative properties of mercury. Mercury levels in the ambient air do not pose a direct threat to public health in Wisconsin. Rather, the public health risk arises from the mercury that is emitted to the atmosphere and deposited to water bodies where it bioaccumulates in fish that are subsequently eaten. Existing state mercury emission standards do not protect public health from the bioaccumulation of mercury in fish.

In 1971, Chapter 272 was enacted by the Wisconsin Legislature in response to high mercury levels found in fish in the Wisconsin River. The legislation addressed mercury discharges directly to the water; mercury use and disposal, recordkeeping requirements; and requires the Department to adopt minimum standards for the emission of mercury compounds or metallic mercury into the air (now in s. 285.11(9), Wis. Stats.). In response to the legislation, the Department established emission standards for mercury. At that time, the contribution of atmospheric deposition to elevated mercury levels in fish was not well understood. The Department also adopted the federal NESHAPS (National Emission Standards for

Hazardous Air Pollutants) for mercury emissions from chlor-alkali facilities and sludge incineration and drying plants. These regulations are included in chapter NR 446, Wis. Adm. Code.

In 1988, the Department promulgated chapter NR 445, Wis. Adm. Code, which regulates the emissions of hazardous air contaminants. Mercury is one of the pollutants regulated under chapter NR 445. However, emissions from fossil fuel combustion, including mercury emissions, are exempt from chapter NR 445. A recent re-analysis of the appropriateness of this exemption concluded that emissions from coal combustion were significantly below levels which could pose an inhalation risk to the public, and that the exemption from chapter NR 445 requirements continued to be appropriate.

Hearing Synopsis

After the Board authorized hearings on proposed revisions to chapter NR 446, Wis. Adm. Code, five public hearings were held during September and October 2001. Public comments received at public hearings and during the comment period were extensive. At the five public hearings over 100 individuals gave statements. In addition, during the comment period over 60 detailed written comments were received from businesses, electric utilities, associations and organizations. More than 2000 cards, letters and emails from Wisconsin citizens supporting the rules were also received. The following chart provides details on these public hearings.

Date	**Location**	**Attendance**	**Appearances**
September 26, 2001	*Eau Claire*	*11*	*6 – In support* *2 – In opposition* *3 – As interest may appear*
September 27, 2001	*Rhinelander*	*22*	*10 – In support* *11 – In opposition* *1 – As interest may appear*
October 1, 2001	*Milwaukee*	*26*	*11 – In support* *4 – In opposition* *11 – As interest may appear*
October 2, 2001	*Appleton*	*18*	*5 – In support* *7 – In opposition* *6 – As interest may appear*
October 3, 2001	*Madison*	*45*	*21 – In support* *8 – In opposition* *16 – As interest may appear*

Summary of Public Comments

Attachment A – Summary of Comments on the Proposed Rules, provides a summary of significant comments received at public hearings and in written comments during the comment period. This comment summary is organized into three sections:

- Significant Comments and Issues Evaluated by the Mercury Citizen Advisory Committee
- Comments on Alternatives Offered for Public Comment
- Other Legislative Council Clearinghouse Comments

Public Contacts after Public Hearings

At the June 2001 Natural Resources Board meeting when public hearings were authorized on proposed rules, Secretary Bazzell requested that the Bureau of Air Management establish a Mercury Citizen Advisory Committee to review public comments and make recommendations for addressing significant areas of concern and controversy. In addition to the Committee, a Mercury Technical Advisory Group was established at the Secretary's request to evaluate technical merits of the proposed rules. The committee that was established included stakeholders representing environmental, industrial, utility, and tribal interests.

Secretary Bazzell requested that the Committee accomplish the following:

- Review public comments and identify key issues for further evaluation.
- Consider the advice provided by the Technical Advisory Group and direct their efforts.
- Develop option analyses of key issues.
- Consider the Governor's energy policy and related state legislative proposals, such as mercury product bans, in the evaluation of key issues.

The committee's final report was provided to the Secretary and members of the Natural Resources Board in September 2002.

Environmental Analysis

An environmental assessment was prepared for the proposed rule to meet the Department's responsibilities under s 1.11 Wis. Stats. and Chapter NR 150, Wis. Adm. Code. Public comment was solicited on a draft assessment during the comment period for the proposed rules. The draft assessment was revised in consideration of comments received. The attached final analysis concludes that this proposed regulation is not a major action and therefore an environmental impact statement is not required prior to final action by the Department to adopt this rule.

Reporting and Recordkeeping Requirements

The reporting and recordkeeping requirements in the revised rules are directed at annual reporting of mercury emissions to the Department. Major stationary sources, defined as sources with mercury emissions of 10 pounds per year or greater, and major utilities have set procedures in the revised rules to perform annual measurements to determine their mercury emissions. The workload for Department staff associated with the proposed reporting and recordkeeping requirements will not be significant.

Final Regulatory Flexibility Analysis

Small business will not be directly affected by the proposed rules. The requirements in the proposed rule are anticipated to only apply to large businesses (i.e. greater than 25 employees or gross annual sales greater than $2,500,000).